Source Water Assessment Program (SWAP) Report
For
EMERSON SCHOOL

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared:
June 29, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	EMERSON SCHOOL
PWS Address	100 MECHANIC STREET
City/Town	BOLTON
PWS ID Number	2034009
Local Contact	JAMES DUCHARME
Phone Number	(978) 779-0539 X3005

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Emerson School	2034009-01G	250	624	High

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

? inventory land uses within the recharge areas of all public water supply sources;
? assess the susceptibility of drinking water sources to contamination from these land uses; and
? publicize the results to provide support for improved protection.

Maintaining Your Good Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attached Map of the Protection Areas

1. Description Of The Water System

The well for the Emerson School is located on the south side of the school building. The Emerson school well has a Zone I of 250 feet and an Interim Wellhead Protection Area (IWPA) of 624 feet. In 1995, the existing well was redrilled to a depth of 355 feet below the surface of the ground. Materials encountered while drilling are described as granite. The bedrock is mapped as the Nashoba formation, which is described as a light gray to medium gray biotite paragneiss. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. The well has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

2. Discussion Of Land Uses In The Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate activities in Zone I;**
2. **An underground storage tank (UST) with heating oil;**
3. **Septic system;**
4. **Aboveground storage tank (AST) with fuel oil; and**
5. **Stormwater drain.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA.

1. **Zone I** - Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The school's Zone I contains the school building, playground, and parking areas. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

   Recommendations:

✓ Keep new non-water supply activities out of the Zone I.
✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, etc.
✓ If the school intends to continue utilizing the structures and parking in the Zone 1, use BMPs and control activities that could pose a threat to the water supply.

2. **Underground Storage Tank (UST)–** A 5,000 gallon double-walled steel UST with fuel oil is located within the protection area of the water supply. If managed improperly, Underground Storage Tanks can be a potential contaminant source due to leaks or spills of the chemicals they store.

   Recommendation:

✓ Any modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

3. **Septic system** - The septic system is located within the IWPA. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic

Table 2: Table of Activities within the Water Supply Protection Areas

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	Fuel Storage Below Ground	Yes	Yes	High	Heating oil tank
	Parking spaces	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
	Playground	Yes	Yes	Moderate	Fertilizer and pesticide use
	Stormwater drain	No	Yes	Moderate	
	Septic System	No	Yes	Moderate	See septic systems brochure in the appendix
	Fuel Storage Above Ground	No	Yes	Moderate	Tank is on pavement, an impervious surface
	Structures	Yes	Yes	-----	Non-water supply structures in Zone I

*** -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

systems is a potential source of contamination to the water supply.

Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.

4. **Aboveground storage tank** - A 4,000 gallon AST is located a few feet from the well. The tank is located on a cement pad but the area is not bermed. If managed improperly, Aboveground Storage Tanks can be a potential contaminant source due to leaks or spills of the chemicals they store.

Recommendation:

- ✓ Remove or relocate the AST from the Zone I, or provide 110% secondary containment for the AST. Comply with all provisions of the regulations regarding AST. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, local regulations and fire code requirements.

5. **Stormwater drain** - A storm water drain identified within the protection area is a potential source of contamination to the water supply. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Recommendations:

- ✓ Consider nonstructural techniques such as parking lot sweeping to reduce the amount of potential contaminants in storm water runoff.
- ✓ Additionally, the public water supplier may want to consider structural BMPs (e.g. stormwater swale, detention basin, etc.) as part of comprehensive storm water management plan for the site (refer to Storm Water Management Handbook, Volume 1 and 2 for information on BMPs).

Implementing the following recommendations will reduce the system's susceptibility to contamination.

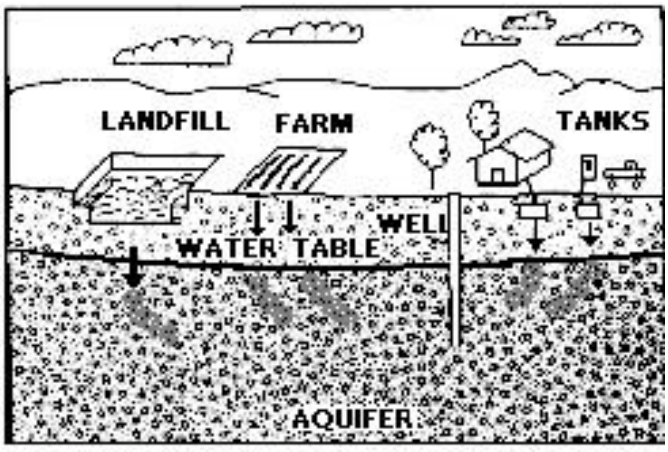

Figure 1: Example of how a well could become contaminated by different land uses and activities.

3. Protection Recommendations

Emerson school should review and adopt the following recommendations at the facility:

Zone I:

- ✓ Remove all non-water supply activities from Zone I, to comply with DEP's Zone I requirements. Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.
- ✓ Do not use fertilizers or road salt within Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material disposal, emergency response, and best management practices
- ✓ Incorporate groundwater education into school curriculum (K-6).

For More Information:

Contact Josephine Yemoh-Ndi in DEP's Worcester Office at (508) 792-7650 x 5030 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at: www.state.ma.us/dep/brp/dws.

Copies of this assessment have been provided to the water department, town boards, the town library and the local media.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/brp/dws/dwspubs.html.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on Emerson School property.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.

3 The septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic

4. Attachments

- **Recommended Source Protection Measures Factsheet**
- **Your Septic System Brochure**
- **Pesticide Use Factsheet**